afforded by the published data. In fact, the report generally bears evidence of having been drawn up on the supposition that the data are practically complete, whereas such perfection, or anything like it, is an absolute impossibility. The committee, and others interested in bird migration, would do well to remember that not one bird in a thousand that arrives on our shores, or which proceeds inland or coastwise, comes under the notice of competent observers, numerous though they be. This important consideration makes it imperative that some years must be devoted to the amassing and testing of materials ere the foundations of a trustworthy report can be laid.

The records collected by the committee are numerous, and, as interim reports seem to be desired, may be considered of sufficient interest and value to render them worthy of publication. There are a number of unfortunate slips in the report, some of which are so palpable that it seems strange that Mr. Bonhote's—the preparer's—colleagues on the committee did not detect them. W. E. C.

PRESERVATION OF MEMORIALS IN AMERICA.

AS an outcome of an article which appeared in these columns on June 6 (p. 130), entitled "Landscape Protection in Germany," the American Scenic and Historic Preservation Society has sent us some of its literature. This society was incorporated in 1895 by a special act of the Legislature of the State of New York, and holds, therefore, a semi-official position in that State. It has to report annually to the Legislature, and has a right to make recommendations regarding improvements to any of the municipalities.

The society's aims are summed up to a large extent in its name. It endeavours "to protect beautiful features of the natural landscape from disfigurement, either by physical alterations or by the erection of unsightly signs and structures, and to preserve from destruction remarkable geological formations or organic growths possessing an artistic or scientific value"; and it also endeavours "to save from obliteration names, places, and objects identified with local, State and national history; to erect suitable historical memorials where none exist."

In towns and villages it aims at procuring parks and open spaces, where necessary for the health and comfort of the inhabitants; it makes every effort to prevent the destruction of trees, and stimulates as much as possible a desire for local beautification in the minds of the public.

The funds depend on the members' subscriptions and voluntary contributions. The Government gives no financial support, but public money is occasionally placed at its disposal for acquiring or keeping in order properties for the public benefit. It is also empowered, according to its charter, "to receive real or personal property, in fee, or trust . . . and to administer it as a public trustee."

By means of meetings, free lectures, circulating historical pamphlets, and various educational means, the society endeavours to engrain in the people an appreciation of the beauties of nature, and also a patriotic interest in historical localities. Its efforts are becoming fully appreciated all over America, for its services are requisitioned in many different parts and in many different ways, the verifying of historical sites and putting up of tablets to commemorate noteworthy events being the most usual. America is much to be congratulated on having such a society, and especially one that is so active.

NOTES.

PROF. J. B. FARMER, F.R.S., has accepted the editorship of the *Gardeners' Chronicle* in succession to the late Dr. M. T. Masters, F.R.S.

THE inaugural address of the coming session of the Royal Scottish Geographical Society will be delivered by Lord Milner in the Synod Hall, Edinburgh, on Wednesday, November 13.

WE regret to see the announcement that Prof. L. F. Vernon Harcourt, emeritus professor of civil engineering at University College, London, died on Saturday, September 14, at sixty-eight years of age.

THE managers of the Metropolitan Asylums Board have approved of the erection at Belmont, Surrey, of new laboratories for the preparation of diphtheria anti-toxin and for bacteriological work. The total expenditure on the laboratories is not to exceed 6500*l*.

Symons's Monthly Magazine, the present issue of which is the five hundredth number of that interesting organ of meteorological opinion, announces that Dr. G. Hellmann has been appointed professor of meteorology in the University of Berlin and director of the Prussian Meteorological Service, in succession to the late Prof. von Bezold.

A TELEGRAM from Seattle states that a volcano in the Aleutian Islands became active on September 1 and 2, and that ash ejected from it fell upon twenty villages. A disturbance recorded by a seismograph at Washington on September 2 appears to have been due to this eruption.

THE Royal Geographical Society has received the following telegram referring to the Anglo-American Polar Expedition, signed by Captain Mikkelsen and Mr. Leffingwell:—"Sledge trip covering 500 miles crossed edge continental shelf twice soundings 50 miles off coast and beyond 630 metres no bottom ship lost next year continuation geology ethnography surveying and exploration Beaufort Sea."

THE Royal Commission on Mines has appointed Dr. A. E. Boycott to make an investigation with a view to determine whether there are any indications of the disease known as ankylostomiasis (miner's worm) in coal mines in Great Britain. Mr. John Cadman has also been appointed to make a series of observations and tests of mine air in connection with the question referred to the commission whether any steps should be taken to lay down a standard of ventilation in mines.

PROF. E. HECKEL, director of the Colonial Institute at Marseilles, has been awarded the gold medal founded by Dr. F. A. Flückiger, of Strassburg, in 1893, and awarded every five years, in recognition of steps taken to promote the advancement of scientific pharmacy, irrespective of nationality. Mr. E. M. Holmes, the curator of the museums of the Pharmaceutical Society of Great Britain, received the first medal, and the second was presented to Dr. C. Schmidt, of Marburg.

THE discovery of an interesting dene-hole on the south side of Windmill Hill, Gravesend, was described in the *Times* of September 14. It appears that a workman engaged in making excavations for building purposes discovered a shaft, rather less than 3 feet wide, which descended vertically to a depth of 55 feet from the surface, when it entered the chalk, and after piercing 3 feet of this rock opened out into a large artificial cavern. This cave was divided into two chambers by a roughly hewn

wall of solid chalk, a western chamber measuring about 30 feet by 24 feet, and an eastern one about 24 feet by 20 feet. The excavation consequently presented the exceptional character of a twin chamber. The roof showed numerous holes, apparently made by picks of horn used in excavating the chalk, whilst the walls had been smoothed, perhaps by means of flints. A curious smoothness on part of the roof of the eastern chamber, clearly due to long-continued but gentle friction, led to the suggestion that some substance like corn in the ear had been pitched into the chambers from the top of the wall, which formed a platform under the shaft, thus apparently lending some support to the view that the dene-hole may have been used as a subterranean store-house for grain.

OWING to the development of wireless telegraphy in the Navy, the Admiralty has decided to establish a separate branch of the Service for this work, and this branch will be kept quite distinct from the ordinary signalling branch. In order to place the new section on a proper basis, about three hundred men will be turned over to it as volunteers, taken from the leading signalmen as well as able seamen and marines. Ultimately the telegraphists will be recruited from boys entered in the training ships in the usual way. The Admiralty has also decided to erect a wireless telegraph station for the use of the Royal Naval Service at Corkbeg, near the mouth of Cork Harbour. This station is to supersede Roche Point station, the situation of which is not considered safe.

THE President of the Local Government Board has authorised the following researches under the grant voted by Parliament in aid of scientific investigation concerning the causes and processes of disease:—(1) Further study by Dr. Sidney Martin, F.R.S., of the chemical products of pathogenic bacteria. (2) Bacteriological investigation by Dr. F. W. Andrewes of the air of sewers and drains. (3) Observation by Dr. W. G. Savage of the bacteriology of "garget" and maladies of the udder or teats of milch cows, and of possible relation of sore throat in the human subject to pathological conditions of the udder and teats of these animals; also investigation by him of paratyphoid fever and its microbic cause. (4) Joint investigation by Drs. M. H. Gordon and T. J. Horder of the life-processes of the Meningococcus, with a view to means of combating cerebro-spinal fever.

THE Permanent International Commission of Aëronauts and the International Federation of Aëronauts held conferences at Brussels last week, under the presidency of Prince Roland Bonaparte. An address on the advantages of the universal adoption of the metric system in aëronautics was read by Dr. Guillaume, and a resolution in favour of its adoption by all affiliated aëro clubs was carried unanimously. Papers were also read on air currents, dynamics of the atmosphere, wind velocity, temperatures at high altitudes, aëronautic observatories for practical meteorology, the history of dirigible balloons, progress of the problem of flying and aërial navigation, and the economical manufacture of hydrogen for balloons. On Sunday, thirty-four balloons started from the Parc Cinquantenaire in competition for the valuable cup to be presented to the aëro club of the country the balloon of which covers the greatest distance. The contest was won by a German balloon, which descended at Bayonne, having covered a distance of 1000 kilometres. The second place is shared by a Swiss balloon, which covered 900 kilometres, and a British balloon, which travelled 890 kilometres. The international conference will be held next year in London.

THE *Frithjof*, with the Wellman expedition on board, arrived at Tromsö on September 13, the attempt to reach the North Pole by airship having been abandoned for this year. On September 2 Mr. Wellman's balloon, the *America*, was towed about two miles in a northerly direction to Vogel Bay Island. Off this island the airship was set free, but the wind, coupled with a driving snowstorm, finally beat it back over the mainland of Spitsbergen. The gas being allowed to escape, the airship descended and landed on a glacier about half a mile inland. No damage was sustained, except that a few tubes and wires were broken and bent. The scientific instruments on board were uninjured. The *America* was in the air three hours. In the one hour and a quarter during which she was travelling by her own power she made about fifteen miles, including some beats to windward, demonstrating the power of the motor and the dirigibility of the airship. In three days the entire ship, including even part of the gasoline, was conveyed back to camp in good order. The balloon-house and the entire plant were put into condition for the winter. Three men were left to guard it until next summer.

ON September 13 the *Lusitania*, the world's greatest and fastest ship, reached New York, having covered the distance between Queenstown and Sandy Hook, 2782 miles, in five days fifty-four minutes, at an average speed of 23·01 knots. Although the *Lusitania* has not lowered the Atlantic record, she has crossed at a greater pace than any boat on a maiden voyage ever did before her. The slight difference existing between the *Lusitania's* average and the *Deutschland's* record of 23·15 knots in 1903 is attributed to fog. The progress marked in steamship construction since the advent of the *Umbria* twenty-three years ago is instructive. The length has been increased 50 per cent., and the displacement is more than three times what it was. The power of the machinery has been multiplied by five, but so great is the difficulty of increasing the speed that the *Lusitania*, notwithstanding its enormous advance in size and power, has not added more than 25 per cent. to the speed. The *Lusitania* has a length of 760 feet, a breadth of 88 feet, and a depth of 60 feet 4½ inches. Its draught is 33 feet 6 inches, its displacement 38,000 tons, and its gross tonnage 32,500. It requires about 5000 tons of coal to steam to New York, and carries a cargo of 1500 tons and 2198 passengers. The indicated horse-power of the steam turbines is 68,000, and the steam pressure 200 lb. The full complement of the ship is 827 persons, the navigating staff numbering sixty-nine, the engineering staff 369, and the personal 389.

TWO papers read at a conference of the Catholic Truth Society on September 11 dealt with the question of the bearing of scientific progress upon religious belief. The Rev. J. Gerard, S.J., in a paper entitled "Science and her Counterfeit," pointed out that the true man of science, that is, the investigator actively engaged in scientific research, must be distinguished from purely popular writers and lecturers on scientific subjects. "It is the first principle of science," he remarked, "that nothing should be taken on faith, that we should prove all things, and take no step forward until we have made quite sure of our ground." Many writers, however, who undertake to supply the demand for popular scientific instruction, contradict in their practice the principles which men of science insist upon as necessary for the attainment of real knowledge, and encourage the habit of hasty conclusion instead of the spirit of scientific caution. Hypothesis is an essential part of scientific progress, but, as Dr. B. C. A. Windle explained in a subsequent paper on scientific facts

and scientific hypotheses, it is necessary to distinguish clearly between hypothesis or theory and scientific observation. Let facts be accumulated in as great a measure as possible, and theories too, in reasonable number, but let us be quite clear as to what are facts and what are theories, and quite definite in our ideas as to the relative value of the two categories. Father Gerard and Dr. Windle are justified in their remarks as to the unscientific character of much that is put forward in the name of science, but without the authority of careful and accurate observation. One reason for this is the attempt made to instruct people in scientific progress who will not take the trouble to understand the alphabet of nature. To the general public a sensational assertion is much more interesting than a plain statement of fact, and a personal opinion is confused with the established truth to which it refers. It is, however, a sign of progress that the road to the present position of science is strewn with the wreck of hypotheses and theories. No true philosopher regards a hypothesis or theory as a Procrustean bed upon which all new knowledge must be placed, but only as a working or suggestive explanation of observed facts. In this respect the scientific type of mind differs from that which is content to accept mediæval scholastic philosophy as a final court of appeal for new learning.

Biologisches Centralblatt for August 15 and September 1 contains an article by M. A. Mordwilko, of St. Petersburg University, on the biology of the Aphididæ, being a summary of a larger work on the same subject. The reproduction of these insects is discussed in the first portion of the article.

In *British Birds*, No. 4, Messrs. Witherby and Ticehurst continue their account of important additions to the list of species recorded from our islands since 1899. Attention may also be directed to a note by the first-named writer on the nesting of a pair of herons in a pool on Dungeness beach.

The greater portion of the August issue of the *Museums Journal* is devoted to the conference held at Dundee in July last, where the presidential address was delivered by Mr. J. Maclauchlan. The majority of the papers read was devoted to subjects connected with art and manufactures rather than to natural science.

Two papers in part iii. of vol. li. of the Memoirs and Proceedings of the Manchester Literary and Philosophical Society are devoted to zoological collections made by Mr. S. A. Neave in N.E. Rhodesia. In the first, which is illustrated by a coloured plate of two new species, the collector discusses the birds, while in the second Mr. G. A. Boulenger, who describes one new fish, records the cold-blooded vertebrates obtained.

The habits of the North American short-tailed shrew-mouse (*Blarina brevicauda*) form the subject of an article by Mr. A. F. Shull in the August number of the *American Naturalist*. In winter, at any rate, the species feeds largely on snails of the genus Polygyra. These snails are hoarded by the shrews for future use, the emptied shells being either left on the surface of the ground or deposited in various parts of the nests or burrows. Short-tailed field-mice and vesper-mice are also attacked and killed for food, while numbers of insects and earthworms are likewise consumed. The shrews are therefore highly beneficial to the agriculturist.

To the August number of the *Zoologist* Mr. Graham Renshaw contributes some notes on the Californian condor (*Gymnogyps californianus*), a species in imminent danger of extermination. Although in former days ranging so far north as British Columbia, this condor—the largest bird-of-prey in the United States—is now represented only by a small remnant in south-west California. A flock of twenty-six was, however, seen so lately as 1894, and it is hoped that the species may still be holding its own in the more remote mountains. A specimen is now living in the Zoological Park, New York.

What amounts to little less than a revolution in the taxonomy of invertebrates is proposed by Mr. R. T. Günther in the August issue (vol. li., part iii.) of the *Quarterly Journal of Microscopical Science*. Although their molluscan affinities were suggested by d'Orbigny in 1834, the arrow-worms (Sagitta, &c.) have been definitely classed by nearly all modern zoologists among the annelids, in which they constitute the group Chætognatha. Mr. Günther is, however, convinced that they are in reality primitive molluscs. "No organ of importance," he remarks, "has been described in chætognath anatomy which is not paralleled by similar and, we believe, homologous organs among the Mollusca. Indeed, we believe, we can go further and demonstrate that the divergences of structure between the Chætognatha and the Mollusca are slighter than those known to exist between different orders belonging to the latter phylum." The Mollusca, according to the author, typically pass through a free-swimming ("veliger") stage, and while in creeping and sessile forms the foot and shell attain high development, in pelagic types the shell tends to disappear, and the foot may either likewise atrophy or become modified into a swimming organ. On this view the class may be divided into Nectomalacia and Herpetomalacia, the former including the shell-less Chætognatha and the shelled Cephalopoda, and the latter all the rest.

In *Nature Notes* for September, Mr. O. C. Silverlock records the results of experiments conducted by himself during the last two years with the view of testing the sensibility of ants to changes of temperature and to the ultra-violet rays of the spectrum. As regards the first point, the experiments indicate that very small changes of temperature are perceived by these insects, the sensations of heat in which must be much more delicate than in human beings. Many ants, for instance, perceive so small a rise of temperature as 0°·3 C., while a very large percentage take cognisance of a rise of 0°·5 C. In respect to the ultra-violet rays, it has been already shown by Lord Avebury that these affect ants like true light-rays, and this being so, the author is of opinion that these rays probably appear to them as a colour of which the human mind cannot form a conception. The ants do not appear to be chemically affected by these rays, but they change their positions when placed in the spectrum by reason of their dislike to the colour of these rays, and also on account of the smaller heating effect produced by this end of the spectrum.

In the report for the year 1906–7 of the industrial section of the Indian Museum, Calcutta, Mr. I. H. Burkill enumerates the additions to the collections received during the year; among the last specimens is a sword and silver scabbard presented by the Tashi Lama. Of the products examined by Mr. D. Hooper in the laboratory, the oleo-resin of *Hardwickia binata*, the gum-resin of *Mangifera indica*, and the oil of *Cochlospermum gossypium* are interesting; also the sample of Kashmir hops.

It was a happy inspiration to bring together in the Natural History Museum at South Kensington a collection of Linnean memorabilia in commemoration of the bicen-

tenary of the great Swedish naturalist. The collection, consisting of portraits, autographs, manuscripts, specimens and books, is arranged in one of the bays of the great hall, and a small pamphlet, prepared by Dr. A. B. Rendle, explaining the different exhibits has been issued as the third of the special guides of the museum.

AN ingenious but difficult hypothesis, tracing the origin and evolution of angiosperms to aposporous developments from a type allied to the thallose liverworts, is offered by Mr. O. F. Cook in vol. ix. of the Proceedings of the Washington Academy of Sciences. It is suggested that as aposporous prothalli arise from the sporophyte in certain varieties of *Nephrodium pseudo-mas*, so the gametophyte of the primitive angiosperm may have had its origin; the proposition requires the elimination of the macrospore, and leads to the comparison of the nucellus with an aposporous prothallus, thus running counter to accepted homologies. It cannot be said that the arguments advanced are sufficiently weighty to warrant a reversal of existing opinion.

THE third part of the botanical series of the *Philippine Journal of Science* (vol. ii.) contains determinations of new or little-known indigenous ferns, and a collation of species of Dryopteris, both prepared by Dr. H. Christ, and the diagnoses of new Philippine palms, by Dr. O. Beccari; also Mr. E. D. Merrill contributes a first list of Philippine botanical literature. Dr. Christ notes that there is a tendency to the production of insular reduced types among the ferns, instancing the irregularity and reduction of fronds in *Dryopteris canescens*, and the peculiar stunted forms grouped under *Leptochilus heteroclitus* and *Pteris heteromorpha*. A new species of Christensenia, more recognisable under the generic name Kaulfassia, is described. Dr. Beccari's communication includes three species of Areca, one as robust as *Areca catechu*, also species of Pinanga, Arenga, Livistona, and Calamus.

MR. R. N. HALL, in his "Notes on the Traditions of South African Races, especially of the Makalanga of Mashonaland," reprinted from the *African Monthly*, and published by the African Books Co., Ltd., Grahamstown, has revived his controversy with Mr. R. MacIver regarding the date of the Zimbabwe temple. In his reply to the theory that the ruins cannot be dated earlier than the fourteenth or fifteenth century A.D., he lays special stress on the statement of De Barros that, on the arrival of the Portuguese at Sofala, about 1505, the Moors informed them that the temple was then ancient, and that the Makalanga possessed no tradition of its erection. It is obvious that on such a question the oral traditions of savages are of little value. But Mr. Hall discusses at length various lines of evidence, which, he believes, establish the permanence of such traditions among the Bantu races—their veneration of ancestors, their genealogies of royal families, their belief that their forefathers migrated from the north, their tales of the early Portuguese occupation, of cannibalism, the slave trade, and so on. He further asserts that the Makalanga have been less migratory than their Bantu kinsfolk, and hence their belief in the extreme antiquity of the Zimbabwe is deserving of credit. On the other hand, he admits that these traditions were not recorded at the time when Europeans first came in contact with them. On the whole, the Makalanga traditions in the versions now accessible do not command perfect confidence, and they do not furnish conclusive evidence in disproof of the archæological facts on which the conclusions of Mr. MacIver were based.

THE third part (the second in order of issue) of the Eugenics Laboratory Memoirs has just been issued by Messrs. Dulau and Co. It is entitled "The Promise of Youth and the Performance of Manhood," and contains the results of an inquiry, by Mr. Edgar Schuster, into the question how far success in the examination for the B.A. degree at Oxford is followed by success in after-life. Apart from the Oxford class lists, the investigation is based on "Crockford" and Foster's "Men at the Bar." The results show a striking relation between the earlier and later success. Thus among those who took their degree in 1859 or previously, and subsequently entered the Church, 68 per cent. of the first-class honours men obtained some clerical distinction or first-class scholastic appointment, whilst the percentage falls to 37 per cent. for the second-class men, 32 per cent. for the third class, 29 per cent. for the fourth, 21 per cent. for those who took pass degrees, and 9 per cent. only for those who took no degrees. The results in the case of those subsequently called to the Bar are similar. Taking a rougher division, 32 per cent. of those who obtained first to fourth-class honours subsequently obtained some form of office or appointment that was reckoned as distinction, whilst only 16 per cent. of those who obtained pass degrees or no degrees did so. It would seem from these figures that the degree examinations are a better test of general ability, and not of a merely special type of ability, than is generally believed. It seems a pity that these memoirs cannot be issued at a lower price, or, preferably, published in some recognised journal.

DR. GUSTAV VON ZAHN contributes to Nos. 5 and 6 of the current volume of the *Zeitschrift der Gesellschaft für Erdkunde* a paper on the physical and economic geography of the isthmus of Tehuantepec. The author visited the isthmus in October, 1906, and devoted special attention to existing and possible routes across it as means of inter-oceanic communication. His conclusions are strongly in favour of a new Transpacific route from Salina Cruz.

A LECTURE delivered before the Versammlung deutscher Naturforscher und Ärzte at Stuttgart by Prof. Dr. E. Hammer in September last is reprinted in *Petermann's Mitteilungen* (vol. liii., p. 97). Prof. Hammer discusses the scales of maps most useful for geological and general economic purposes, favouring 1 : 25,000 for ordinary publication. He lays great stress on the need for such maps bearing some indication of the degree of accuracy of the contour lines shown, as well as of the actual determinations of height upon which the contours depend.

THE *Mitteilungen* of the Vienna Geographical Society contains (vol. l., p. 139) an interesting paper on the "zonal" distribution of rainfall, by Dr. Fritz von Kerner. The author has repeated and extended the measurements of Loomis's rainfall maps made by Sir John Murray, using the more recent maps of Supan, and gives the rainfall in belts of latitude, first for all longitudes and also for the eastern and western old world and the new world separately. Detailed comparisons are given with Murray's results, and also with the measurements of Bezdek published in 1904. Supan's maps for the four seasons are treated in a similar way, the accuracy of the work being tested by comparing the sums of the four seasonal values with those obtained independently from the map for the whole year.

THE most noteworthy feature in the report of the Mauritius Observatory for 1906 is the shortage of rainfall; the annual amount for the island (mean of fifty-

seven stations) was 72·4 inches, as compared with the average, 79·5 inches. Notice is directed to an apparent connection between droughts in Natal and Mauritius, well-marked winter droughts at the coast stations of the former place being followed by summer droughts in Mauritius at intervals of from three to seven months.

WE have received from the Deutsche Seewarte its monthly meteorological chart for the North Atlantic Ocean for September, which, like the corresponding chart published in this country, is replete both on face and back with information of value to seamen, and includes notes on ice, fog, &c., brought down to the latest possible date. A comparison of the face of the English and German charts naturally exhibits slight differences in the results; this is unavoidable when compilation is made from data received from different sources. The back of the German publication contains, *inter alia*, charts showing the weather conditions between Ushant and Gibraltar, and sudden changes observed in the sea-surface temperature south of the Newfoundland Bank, each chart being accompanied with useful explanatory text.

THE Publications of the Japanese Earthquake Investigation Committee, Nos. 23 and 24, are devoted to an account and study of the seismograms of what is called the "Great Indian Earthquake of 1905." The preface states that these are issued as a systematised account of the instrumental observations of the earthquake, to be laid, for discussion, before the International Seismological Association at its next general conference. The data yielded by the seismograms are discussed with a wealth of elaboration and tabulation which tends to obscure the conclusions drawn; some of these are diametrically opposed to those generally held in this country, and the data on which they are based seem more consistent with the view that this earthquake was not so very great," and that the distant records are imperfect. The value of the series of reproductions of forty-one seismograms taken at twenty-nine different stations would have been increased had the reproductions of Milne seismograms been less coarse in texture, but even with this drawback they form a collection which will be extremely useful to students of seismology, and we have only to regret that it should have been left to the Japanese Government to produce an adequate report of a British earthquake.

A NEW microphone for wireless telephony, the invention of Prof. Majorana, is described in the *Electrician* of August 30. The microphone consists of a jet of water falling on a collector made of two cylindrical pieces of platinum. The two pieces of platinum are connected to a battery, and a current passes depending on the thickness of the water film connecting the two surfaces; this thickness is varied by passing the stream of water before it falls on the collector through a receptacle, one side of which is formed by a membrane actuated in the ordinary manner of a telephone transmitter. It is stated that the vibrations produce corresponding fluctuations in the water jet, and the secondary current reproduces in consequence the sound waves. The collector circuit is connected to the spark-gap in the wireless transmitter, a Poulsen arc in nitrogen being the most suitable spark-gap to employ. No particulars are given of distances over which transmission has been accomplished.

THE *Halbmonatliches Literaturverzeichnis* of the *Fortschritte der Physik* continues to fulfil its function of bringing the titles of papers published in the various departments of physics promptly before its readers. It is interesting to notice that nearly 40 per cent. of the papers published fall within the section cosmical physics.

THE general characteristics of the treatment of elementary geometry adopted by Messrs. Barnard and Child in their "New Geometry for Schools" (Messrs. Macmillan and Co., Ltd.) and similar volumes have been described in these columns on more than one occasion (vol. lxix., pp. 96 and 391; vol. lxxi., p. 174). To meet the requirements of teachers and students who wish only to follow the subject up to particular standards, the course of work has been subdivided, and three new volumes containing various sections have recently been published. Part iii. of "A New Geometry" contains the equivalent Euclid, Books ii., iii. (35–7), and the harder parts of Book iv.; parts iii. and iv. (in one volume) include, in addition, Euclid, Book vi., and the algebraical treatment of ratio and proportion for commensurable quantities; and "A New Geometry for Middle Forms" contains the substance of Euclid, Books i.–iv., together with additional matter. The six volumes, which now form Messrs. Barnard and Child's series on practical and theoretical geometry for schools, provide students in any part of the Empire with courses of study which cover satisfactorily the revised syllabuses of examining bodies, and follow the reformed methods of geometrical teaching brought about by the reports of committees of the British Association and the Mathematical Association.

OUR ASTRONOMICAL COLUMN.

DANIEL'S COMET (1907*d*).—An excellent reproduction from a photograph, and a description of comet 1907*d*, are published in the September number (p. 385) of the *Bullétin de la Société astronomique de France* by M. F. Quénisset, of the Juvisy Observatory. With a clear sky, the comet appeared incomparably brighter than the Andromeda nebula, and gave the impression of being about the brightness of a second-magnitude star; the tail could be seen, by the naked eye, extending to a distance of 8° or 10°. Between July 12 and August 15 twenty-six photographs were obtained, three portrait lenses of 16·0, 13·5, and 3·8 cm. aperture, and 0·740, 0·565, and 0·130 metre focal length, respectively, being chiefly employed. On these photographs the structure of the tail is very sharply defined, and on one obtained with the last-named objective the tail can be traced for not less than 17°. From the photographs obtained with this instrument on August 7 and 8 there is evidence of a rotatory motion of the comet about a line joining the nucleus and the sun.

As seen in the 24-cm. (10-inch) equatorial and on the photographs taken with a Viennet objective, the structure of the tail near the head was fan-like, the colour being a fine green, and the brightest part was directed towards the sun. A visual examination of the comet with a spectroscope revealed the three strong hydrocarbon bands on a brilliant background of continuous spectrum. These bands were sharply defined on the red side, and faded away gently towards the violet, and, on replacing the spectroscope slit, they, with others, were seen resolved into lines; the order of their brightness was green, blue, orange.

From Mr. G. Gillman, of Aguilas (Spain), we have received a drawing showing the observed path of the comet from August 13 to 21. On the former date Mr. Gillman, as shown on his drawing, was able to trace the tail for a distance of 25° in a W.S.W. direction.

Owing to its decreasing brightness and to the fact that it does not rise until about 1½ hours before sunrise, the comet is becoming a difficult object, but we give below a further extract from the ephemeris published in No. 4196 (p. 337, August 23) of the *Astronomische Nachrichten*:—

Ephemeris 12h. (Berlin M.T.).

1907	α (true) h. m.	δ (true) ° ′	log *r*	log Δ	Brightness
Sept. 21 ...	10 46·3 ...	+7 5·1 ...	9·8179 ...	0·1879 ...	6·4
23 ...	10 55·7 ...	+6 25·8			
25 ...	11 4·8 ...	+5 47·1 ...	9·8550 ...	0·2085 ...	4·9